

UNCLASSIFIED

AD NUMBER

AD860601

LIMITATION CHANGES

TO:

Approved for public release; distribution is unlimited.

FROM:

Distribution authorized to U.S. Gov't. agencies and their contractors; Critical Technology; 15 SEP 1969. Other requests shall be referred to Assistant Chief of Staff for Force Development, Army Department of the Army, Washington, DC 20310. This document contains export-controlled technical data.

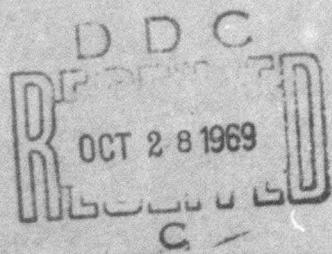
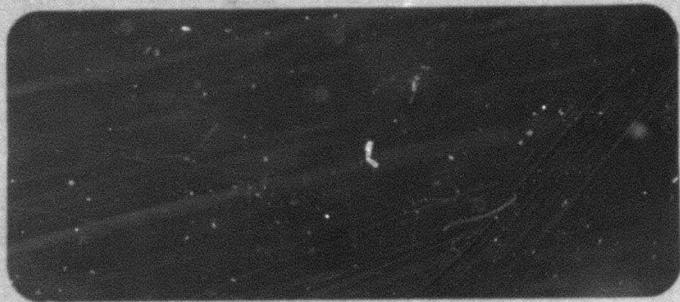
AUTHORITY

OACSFOR D/A ltr, 13 Sep 1973

THIS PAGE IS UNCLASSIFIED



AD 860601



ARMY CONCEPT TEAM IN VIETNAM  
APO SAN FRANCISCO 96384

36

STATEMENT #2 UNCLASSIFIED

This document is subject to special export controls and each  
transmittal to foreign governments or foreign nationals may be  
made only with prior approval of

DEPARTMENT OF THE ARMY

ARMY CONCEPT TEAM IN VIETNAM  
APO San Francisco 96384

FINAL REPORT

XM203 40MM GRENADE LAUNCHER  
ATTACHMENT DEVELOPMENT

ACTIV Project No. ACG-14/69I

15 September 1969

Approved:

*John E. Reid*  
JOHN E. REID  
Colonel, Infantry  
Commanding

DDC  
RECEIVED  
OCT 28 1969

AVHGC-DST (15 Sep 69) 1st Ind

SUBJECT: Final Report - XM203 40mm Grenade Launcher Attachment Development

HEADQUARTERS, UNITED STATES ARMY, VIETNAM, APO San Francisco 96375 16 OCT 1969

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOP-DT,  
APO 96558

1. The attached final report is forwarded for review and transmittal to Department of the Army. Request one copy of the CINCUSARPAC forwarding indorsement be furnished to Commanding General, US Army, Vietnam, ATTN: AVHGC-DST, APO 96375, and Commanding Officer, Army Concept Team in Vietnam (ACTIV).

2. This Headquarters concurs in the ACTIV Final Report with one exception. The ACTIV recommendation that the XM203 replace the M79 is concurred in only for those units equipped with the M16 rifle.

3. Recommend the XM203 be type classified Standard A.

FOR THE COMMANDER:

  
B. A. GOODWIN  
MAJ, ADC  
Assistant Adjutant General

#### AUTHORITY

Letter, FOR ACTIV, Department of the Army, 26 November 1968, subject: Evaluation of the Grenade Launcher Attachment Development (GLAD) (XM203) Weapons System in RVN (U), Confidential

#### ACKNOWLEDGMENTS

Appreciation is expressed to the officers and men of the 1st, 4th, and 25th Infantry Divisions, 101st Airborne Division (Airmobile), and 11th Armored Cavalry Regiment whose professionalism and cooperation were fundamental to the conduct of this evaluation. The Army Concept Team in Vietnam is also indebted to the following for their invaluable help in the evaluation:

MAJ Robert W. Batts, US Army Infantry School  
SSG Robert Glenn, US Army Infantry School  
Mr. Richard Thompson, Aircraft Armaments, Inc.

#### ACTIV PROJECT OFFICER

LTC David H. Weddington, Infantry

#### EVALUATORS

MSG William T. Jones, 25th Infantry Division  
SFC Bonifacio V. Rios, 4th Infantry Division  
SFC John D. Thompson, 1st Infantry Division  
SSG Richard C. Smith, 101st Airborne Division (Airmobile)  
SSG Allan D. Mutchler, 11th Armored Cavalry Regiment

## ABSTRACT

The Army Concept Team in Vietnam evaluated the XM203 40mm Grenade Launcher Attachment Development to determine its suitability for tactical use by US Army units in the Republic of Vietnam (RVN). The XM203 was designed to provide the rifle squad's grenadier with a weapon incorporating an M16 rifle and a grenade launcher. In April 1969, 500 XM203s were sent to RVN and distributed to the 1st, 4th, and 25th Infantry Divisions, the 101st Airborne Division (Airmobile), and the 11th Armored Cavalry Regiment for a three-month evaluation.

The salient conclusions of the evaluation are:

1. The XM203 is suitable for use by US Army units in RVN.
2. The battlesight and quadrant sight are useful during training, but they are not needed once the firer becomes proficient in the pointing technique.
3. The basic design of the XM203 is satisfactory; however, the following changes need to be made:
  - a. Remove the front sling swivel.
  - b. Modify the trigger so the safety does not inadvertently slip to the SAFE position.
  - c. Modify the trigger guard so the firer can be assured his finger will not be pinched between the trigger guard and M16 magazine.
  - d. Checker the handgrip of the XM203 to give the firer better contact when his hands become slippery.
  - e. Modify the sling for attachment to the front sight and butt plate.
  - f. Modify the handguard insert so it does not break when the firer tries to disengage it from the front retainer.
4. During combat in RVN, personnel prefer to use the XM203, rather than the M79 grenade launcher, because the XM203 provides greater firepower and versatility.

It is recommended that:

1. The XM203 replace the M79.
2. The modifications indicated in paragraph 3 be incorporated in the XM203.
3. The quadrant sight be eliminated from the XM203.

## TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	iii
ABSTRACT	v
INDEX OF FIGURES	ix
SECTION I - INTRODUCTION	
1. References	I-1
2. Purpose	I-1
3. Objectives	I-1
4. Background	I-1
5. Description	I-2
a. Attachment	I-2
b. Sights	I-2
c. Characteristics	I-2
6. Approach	I-6
7. Environment	I-6
8. Data Collection and Analysis	I-6
a. Tactical Employment	I-6
b. Operational Characteristics	I-6
c. Maintainability	I-6
SECTION II - OBJECTIVE 1: TO DESCRIBE AND EVALUATE TACTICAL EMPLOYMENT OF THE XM203	
9. Training Requirements	II-1
a. Initial Training	II-1
b. Unit Training	II-1
10. Engagements	II-1
a. Personnel Receiving XM203s	II-1
b. Types of Targets Engaged	II-2
c. Ranges	II-3
d. Technique of Fire	II-3
11. Suitability of Battlesight and Quadrant Sight	II-3
a. Battlesight	II-3
b. Quadrant Sight	II-4
12. Portability	II-4
13. Basic Ammunition Load	II-5
14. Basis of Issue	II-5

15. Findings	II-8
a. Training Requirements	II-8
b. Engagements	II-8
c. Suitability of Battlesight and Quadrant Sight	II-8
d. Portability	II-9
e. Basic Ammunition Load	II-9
f. Basis of Issue	II-9

SECTION III - OBJECTIVE 2: TO EVALUATE OPERATIONAL  
CHARACTERISTICS OF THE XM203

16. Configuration	III-1
17. Acceptability	III-1
18. Reliability	III-2
a. Malfunctions	III-2
b. Shortcomings	III-3
19. Findings	III-3
a. Configuration	III-3
b. Acceptability	III-4
c. Malfunctions	III-4
d. Shortcomings	III-4

SECTION IV - OBJECTIVE 3: TO DETERMINE MAINTENANCE  
REQUIREMENTS FOR THE XM203

20. Identification of Parts Prone to Rust and Wear	IV-1
21. Prescribed Maintenance	IV-1
22. Necessary Tools	IV-2
23. Firings	IV-2
a. Identification of Parts Prone to Rust and Wear	IV-2
b. Prescribed Maintenance	IV-2
c. Necessary Tools	IV-2

SECTION V - CONCLUSIONS AND RECOMMENDATIONS

24. Conclusions	V-1
25. Recommendations	V-2

ANNEX A - Distribution	A-1
------------------------	-----

## INDEX OF FIGURES

<u>Figure</u>		<u>Page</u>
I-1	XM203 Grenade Launcher on M16A1 Rifle	I-3
I-2	Quadrant Sight (Side and Top Views)	I-4
I-3	Battlesight (Rear, Side and Top Views)	I-5
II-1	Percentage of Personnel Armed with the XM203	II-2
II-2	Percentages of Types of Targets Engaged	II-2
II-3	Percentage of Engagement Ranges by Types of Targets	II-3
II-4	Percentage of Time Battlesight Used	II-4
II-5	Distribution of the Number of 5.56mm Magazines Carried as Basic Load	II-6
II-6	Distribution of the Number of 40mm HE Rounds Carried as Basic Load	II-7
II-7	Percentage of Respondents Preferring XM203 and M79	II-8

## SECTION I

### INTRODUCTION

#### 1. REFERENCES

- a. Letter, FOR ACTIV, Department of the Army, 26 November 1968, subject: Evaluation of the Grenade Launcher Attachment Development (GLAD) (XM203) Weapons System in RVN (U), Confidential.
- b. Message, 83787 AVHGC-DST, US Army, Vietnam, 12 December 1968, subject: Evaluation of the Grenade Launcher Attachment Development (GLAD) (XM203) Weapons System in RVN (U), Confidential.
- c. Message, 897662 DA, Department of the Army, 17 February 1969, subject: Evaluation of Grenade Launcher, XM203 (U), Confidential.
- d. Message, 48166 AVHGC-DST, US Army, Vietnam, 26 February 1969, subject: Evaluation of Grenade Launcher, XM203 (U), Confidential.

#### 2. PURPOSE

To determine the suitability of the XM203 40mm Grenade Launcher Attachment Development for tactical use by US Army units in the Republic of Vietnam (RVN).

#### 3. OBJECTIVES

##### a. Objective 1

To describe and evaluate tactical employment of the XM203.

##### b. Objective 2

To evaluate operational characteristics of the XM203.

##### c. Objective 3

To determine maintenance requirements for the XM203.

#### 4. BACKGROUND

The M79 grenade launcher was developed to give the Army a weapon which would provide aimed flat trajectory fire and medium high angle fire, plus a high explosive, fragmentation projectile. However, the M79 deprived the rifle squad of two rifles. A requirement was then developed to provide the rifle squad's grenadier with a weapon incorporating a rifle and a grenade launcher. The XM203 was developed to fill this requirement. In November 1968, the Office of the Assistant Chief of

Staff for Force Development, Department of the Army, requested that the Army Concept Team in Vietnam conduct a three-month evaluation of the XM203.

## 5. DESCRIPTION

### a. Attachment

The XM203 is a single-shot, lightweight, manually operated, pump-action grenade launcher designed to be installed on the underside of the rifle barrel on the M16 rifle (see Figure I-1). A special handguard, and bayonet lug and sling swivel assembly is used with the rifle when the launcher is installed. The XM203 is capable of firing all 40mm low velocity ammunition. The design of the XM203 includes a firing mechanism, safety, and trigger separate from that of the rifle. The XM203 is operated by sliding the barrel of the launcher forward, inserting a round in the chamber, moving the barrel rearward to the locked position, aiming, and then pulling the trigger. Cocking is accomplished mechanically when the barrel is open; extraction and ejection of the fired cartridge case is also done mechanically when the barrel is moved forward. The safety, located inside the trigger guard, must be manually moved to the SAFE and FIRE positions.

### b. Sights

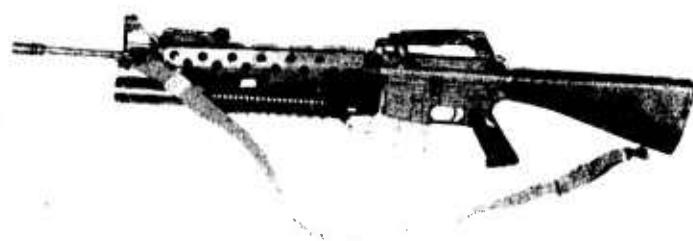
The XM203 is equipped with two sight systems, a quadrant sight and a battlesight. The quadrant sight, which attaches to the left side of the rifle carrying handle, is graduated in 25-meter increments of range from 50 to 400 meters. The battlesight, which is attached to the top of the special handguard, is graduated in 50-meter increments of range from 50 to 250 meters. The front sight post of the rifle is the front sight for the battlesight system. Both sights are adjustable for elevation and deflection. Figures I-2 and I-3 are pictures of the sights.

### c. Characteristics

Length of launcher (overall)	15-5/16 inches
Length of barrel	12 inches
Weight (loaded)	3.6 pounds
Weight (unloaded)	3 pounds
Weight (M16 and XM203 loaded)	10.6 pounds
Muzzle velocity	235 fps
Trigger pull	5 pounds
Maximum range	400 meters
Maximum effective range (area target)	350 meters
Maximum effective range (point target)	150 meters

**Minimum safe range:**

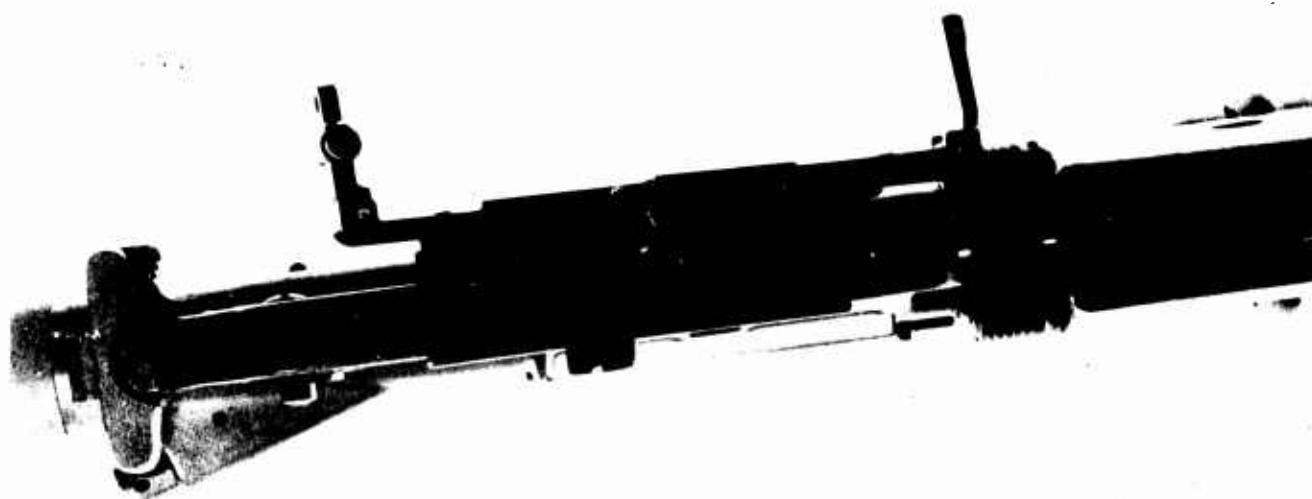
Training	80 meters
Combat	31 meters
Number of lands	6



**FIGURE I-1. XM203 Grenade Launcher on M16A1 Rifle.**

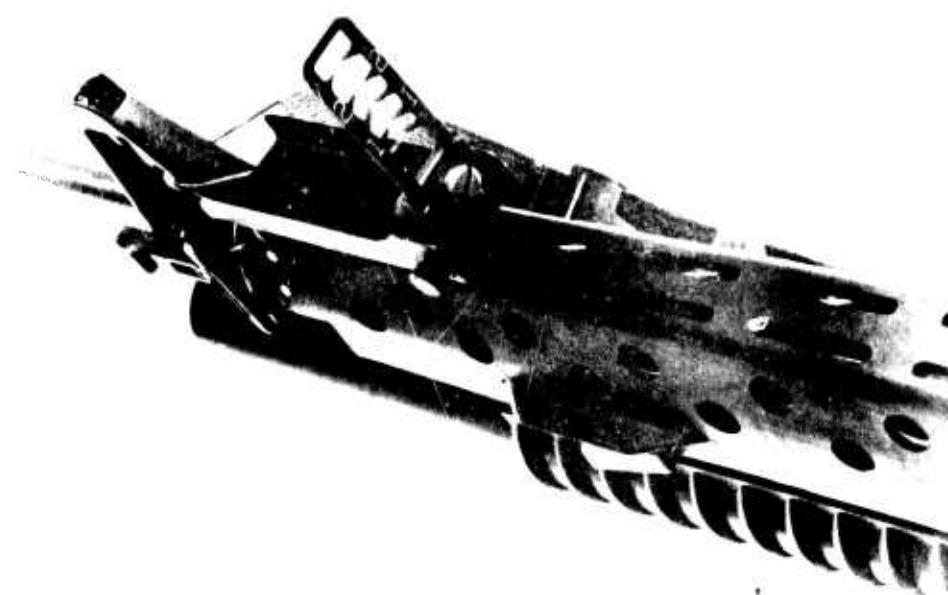


Side View

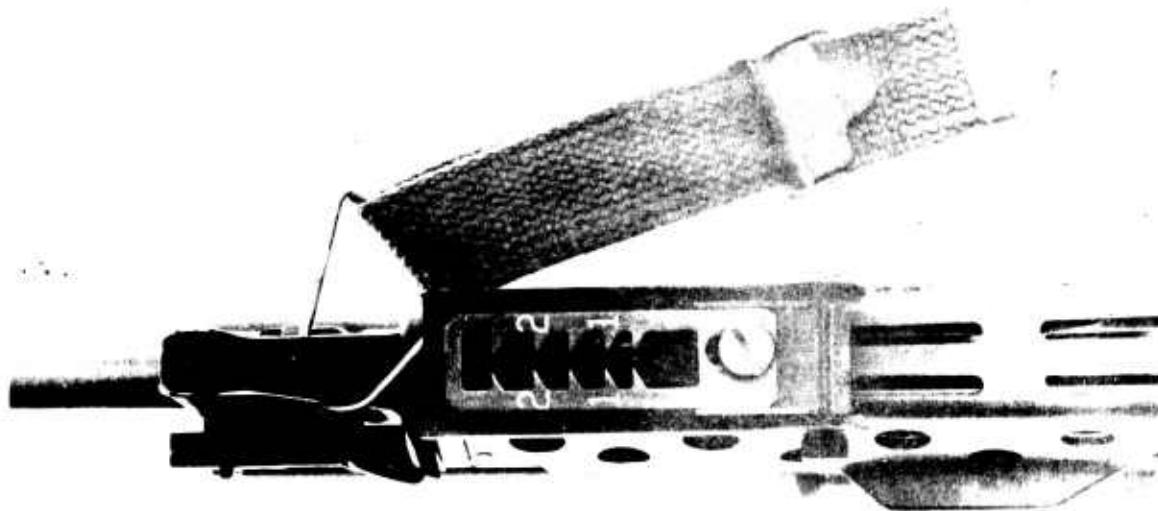


Top View

FIGURE I-2. Quadrant Sight (Side and Top Views).  
I-4



Rear, Side View



Top View

FIGURE I-3. Battlesight (Rear, Side, and Top Views).

## 6. APPROACH

In April 1969, 500 XM203s were sent to RVN and distributed as follows:

1st Infantry Division	100
4th Infantry Division	90
25th Infantry Division	100
101st Airborne Division (Airmobile)	110
11th Armored Cavalry Regiment	100

The personnel using the weapons were given training in the operation and maintenance of the XM203 by a seven-man New Equipment Training Team (NETT). The XM203s were employed in operational missions from 7 April to 18 June 1969.

## 7. ENVIRONMENT

The areas of operation for the evaluating units were in the I, II, and III Corps Tactical Zones (CTZs). These CTZs include the Mekong Terrace, Western Plateaus, Northeastern Coastlands, and Northern Highlands. There was dry weather in the Northeastern Coastlands, while the other areas experienced rain.

## 8. DATA COLLECTION AND ANALYSIS

Three categories of operational variables were investigated: tactical employment, operational characteristics, and maintainability. Each variable was characterized by several performance factors listed below.

### a. Tactical Employment

- (1) Training requirements.
- (2) Type of targets engaged.
- (3) Range to targets engaged.
- (4) Suitability of quadrant sight and battlesight.
- (5) Portability
- (6) Basic ammunition load.
- (7) Basis of issue.

### b. Operational Characteristics

- (1) Configuration.
- (2) Acceptability.
- (3) Reliability.

### c. Maintainability

- (1) Identification of parts prone to rust and wear.
- (2) Prescribed maintenance.
- (3) Necessary tools.

Information for measuring these factors was obtained from responses to questionnaires and interviews with men using the XM203 as well as personnel concerned with its employment. Questionnaires were obtained from 196 personnel as follows:

1st Infantry Division	26
4th Infantry Division	30
25th Infantry Division	28
101st Airborne Division (Airmobile)	68
11th Armored Cavalry Regiment	44

The questionnaire responses were the basis for the statistical data contained in this report. The term respondent as used in this report refers to the personnel that completed the questionnaires.

## SECTION II

### OBJECTIVE 1: TO DESCRIBE AND EVALUATE TACTICAL EMPLOYMENT OF THE XM203

This section discusses the training that was given in RVN to personnel armed with the XM203, and describes the weapon's tactical employment. It highlights the types of targets engaged and the ranges to these targets. Problem areas are identified and, where possible, appropriate solutions are recommended. The opinions of the 196 respondents were analyzed to determine a basis of issue for the XM203 weapon.

#### 9. TRAINING REQUIREMENTS

##### a. Initial Training

The NETT was initially programmed to give a six-hour block of instruction to each group of grenadiers, armorers, and direct support maintenance personnel who would be working with the XM203. Due to the high level of experience encountered, this block of instruction was reduced to four hours. It consisted of 2-1/2 hours of classroom work and 1-1/2 hours of range firing. Prior to receiving this instruction each group of students expressed doubts that the XM203 could perform better than the M79. At the conclusion of the training, however, they all had confidence in the new grenade launcher and were eager to try it in combat.

##### b. Unit Training

Due to rotation, casualties, and administrative actions, many of the XM203s changed hands. The training received by replacement personnel normally consisted of a briefing by a trained individual within the unit and familiarization firing. Because of the simplicity of the XM203, new personnel readily adapted to the weapon system. At the conclusion of the evaluation, 65 percent of the personnel armed with the XM203 were trained by the NETT and 35 percent had received on-the-job training.

#### 10. ENGAGEMENTS

##### a. Personnel Receiving XM203s

The XM203s were issued to personnel as shown in Figure II-1. Issue of the weapons was controlled by the commander of evaluating units. Use of the weapon varied noticeably among units. This was attributable to the type unit and personnel strengths at the squad level. In the 11th Armored Cavalry Regiment (ACR), 45 percent of the respondents were vehicle commanders. Generally, squad strengths for the armored personnel carriers were 50 to 70 percent of those authorized. Since riflemen and grenadiers were not always available, vehicle commanders, drivers, and machinegunners were issued the XM203. Therefore, they did

not normally have the opportunity or requirement to employ the XM203 in a conventional ground role. A similar situation existed in the 4th Infantry Division where the XM203s were issued to a mechanized unit.

Personnel	1st Div	4th Div	25th Div	101st Div	11th ACR	All Units
Grenadier	73	53	61	34	12	41
Rifleman	12	17	36	46	29	32
Plt Sgt, Sqd Ldr	15	0	3	20	45*	20
Driver/Mortar Man/Mechanic	0	30	0	0	14	7
*Vehicle Commanders						

FIGURE II-1. Percentage of Personnel Armed with the XM203.

b. Types of Targets Engaged

Respondents were asked to indicate the types of targets engaged. The following categories were identified: reconnaissance by fire, personnel, bunkers, and houses. Typical responses were:

(1) Reconnaissance by fire -"harassment and interdiction; recon by fire on road security; recon by fire, enemy muzzle flashes, results unknown."

(2) Personnel -"VC on a trail, resulted in three KIA, MG position, results unknown; fired at sniper, results unknown; used on ambush, one known kill; personnel in bush, results unknown."

The percentages of types of targets engaged are presented in Figure II-2.

Types of Targets Engaged	1st Div	4th Div	25th Div	101st Div	11th ACR	All Units
Reconnaissance by Fire	42	79	28	84	17	52
Personnel	58	21	28	9	50	28
Bunkers	0	0	19	7	33	14
Houses	0	0	25	0	0	6

FIGURE II-2. Percentages of Types of Targets Engaged.

c. Ranges

The ranges at which respondents most frequently engaged targets are summarized in Figure II-3. This figure presents the percentage of engagement range for each type target for all units. The range varied according to terrain and the mission of the individual armed with the XM203. For example, a point man would normally engage a target at less than 50 meters. In one instance, a point man engaged an enemy soldier at 10 meters, and killed him using the 40mm buckshot round (XM576E1).

Types of Targets Engaged	Range in Meters				
	0-50	50-100	100-200	200-300	300-400
Reconnaissance by Fire	9	40	41	7	3
Personnel	18	32	40	10	0
Bunkers	3	41	51	5	0
Houses	0	20	65	15	0
All Targets	10	36	44	7	3

FIGURE II-3. Percentage of Engagement Ranges by Types of Targets.

d. Technique of Fire

It was generally believed that the enemy was more likely to expose himself when initially engaged with 40mm high explosive (HE) rounds rather than rifle fire. As a result, personnel armed with the XM203 normally fired 40mm HE rounds at a known or suspected target and then covered the target with their M16 rifle while waiting for the enemy to appear. This technique was effective, resulting in several confirmed kills during the evaluation period.

II. SUITABILITY OF BATTLESIGHT AND QUADRANT SIGHT

a. Battlesight

The battlesight is graduated in 50-meter increments from 50 to 250 meters. The adequacy of this design is substantiated by the following findings:

- (1) Ninety percent of the respondents said there was no need for a sight graduated beyond 250 meters.
- (2) Approximately 90 percent of all targets were engaged at ranges less than 200 meters (see Figure II-3).

(3) The percentage of times the XM203 battlesight was used by the respondents is presented in Figure II-4. A total of 73 percent of the respondents did not use the battlesight in combat. This infrequent use does not warrant a more refined design. During training, however, the sight was used until personnel became proficient with the pointing technique. The battlesight was adequate for training and familiarization.

Percentage of Time Battlesight Used	1st Div	4th Div	25th Div	101st Div	11th ACR	All Units
0	88	64	93	76	52	73
25	8	20	4	15	21	14
50	0	0	0	5	11	5
75	0	13	3	2	2	3
100	4	3	0	2	14	5

FIGURE II-4. Percentage of Time Battlesight Used.

b. Quadrant Sight

Each evaluating unit received at least six quadrant sights for evaluation. During NETT training those personnel equipped with the quadrant sight thought it was extremely accurate; however, the sight was not used on combat operations. Attachment of the quadrant sight to the carrying handle of the M16 restricted movement through brush and jungle vegetation because the sight frequently caught on vines and limbs. When the quadrant sight was mounted, respondents found the carrying handle uncomfortable.

c. Experience indicated that a target would seldom present itself long enough for a grenadier to use aimed fire. In most instances, the grenadier was more concerned with delivering a high volume of fire on the target rather than aimed fire. Consequently, the pointing technique was adopted.

12. PORTABILITY

a. The most frequent complaint about the XM203 was that it was awkward to carry. Whereas most soldiers carried the M16 by gripping it around the slip ring, this was not possible with the XM203 attached. Since the weapon was unbalanced, it was difficult to carry by the M16 carrying handle. Most grenadiers improvised a sling that was attached to the front sight post of the M16 and at the small part of the butt stock.

b. Vines and bushes caught between the M16 rifle barrel and the XM203 barrel. This was the second most frequent complaint.

**13. BASIC AMMUNITION LOAD**

a. Distributions of the basic loads of 5.56mm magazines and 40mm HE rounds carried by personnel armed with the XM203 are presented in Figure II-5 and Figure II-6. Data from the 1st, 25th, and 101st Divisions are combined because evaluating units were similar infantry-type units. Data for the 4th Infantry Division and the 11th ACR are combined because XM203s were issued primarily to mechanized troops within these two units. A noticeable variation existed in the number and type of ammunition carried by the individual soldier. There was no meaningful relationship between the number of 5.56mm magazines, the number of 40mm HE rounds, and the number of 40mm buckshot rounds that a respondent usually carried. Some reported combinations were:

- (1) Thirteen magazines of 5.56mm, 25 rounds of 40mm HE.
- (2) Eight magazines of 5.56mm, 40 rounds of 40mm HE, 6 rounds of 40mm buckshot.
- (3) Ten magazines of 5.56mm, 30 rounds of 40mm HE, 10 rounds of 40mm buckshot.

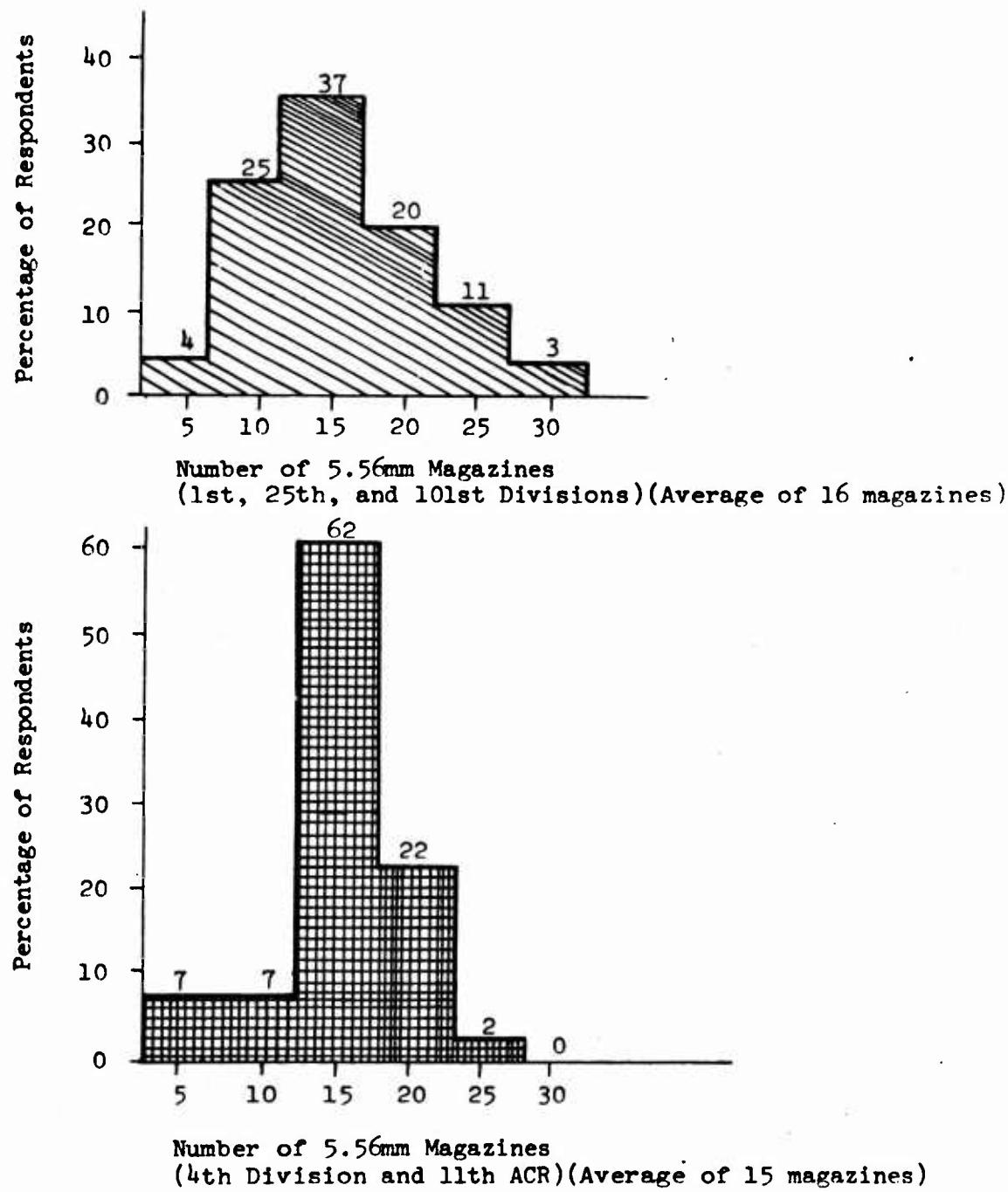
Few respondents included 40mm pyrotechnic and CS rounds as part of their basic loads. Five respondents reported carrying one pyrotechnic round and two respondents reported carrying five.

b. The basic load of ammunition varied depending on terrain, mission, unit SOP, desires of the individuals, and desires of the unit leader.

**14. BASIS OF ISSUE**

a. At the beginning of the evaluation USARV recommended that the M79 be retained in the rifle squads. However, most units exchanged their M79s for XM203s. In one instance, a unit retained its M79s, but once the personnel became familiar with the XM203s, the M79s were turned in.

b. Respondents' preferences for the XM203 versus the M79 are shown in Figure II-7. Vehicle commanders and drivers in the 11th ACR commented that the XM203 was too bulky and too heavy. Vehicle drivers had difficulty handling the XM203 in the confined driver's compartment.



**FIGURE II-5. Distribution of the Number of 5.56mm Magazines Carried as Basic Load.**

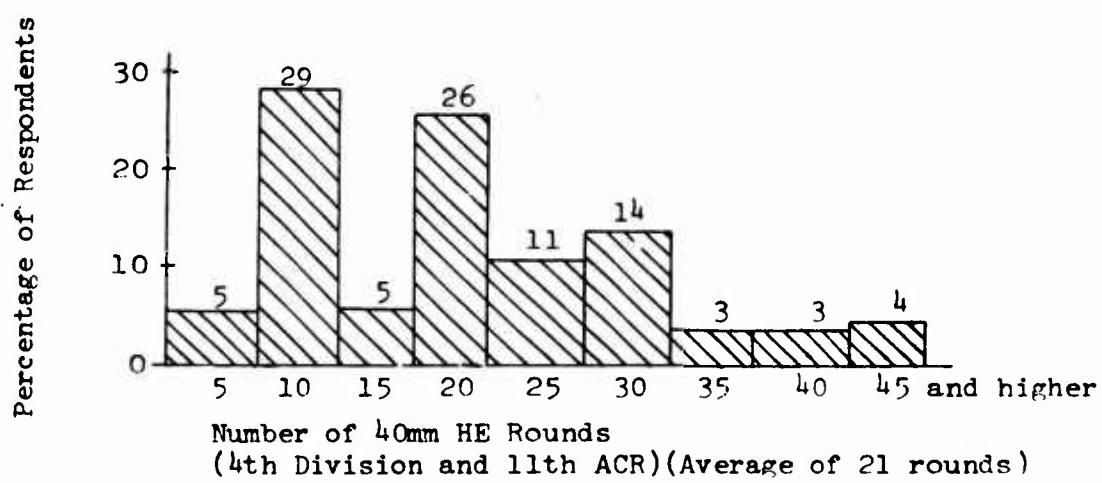
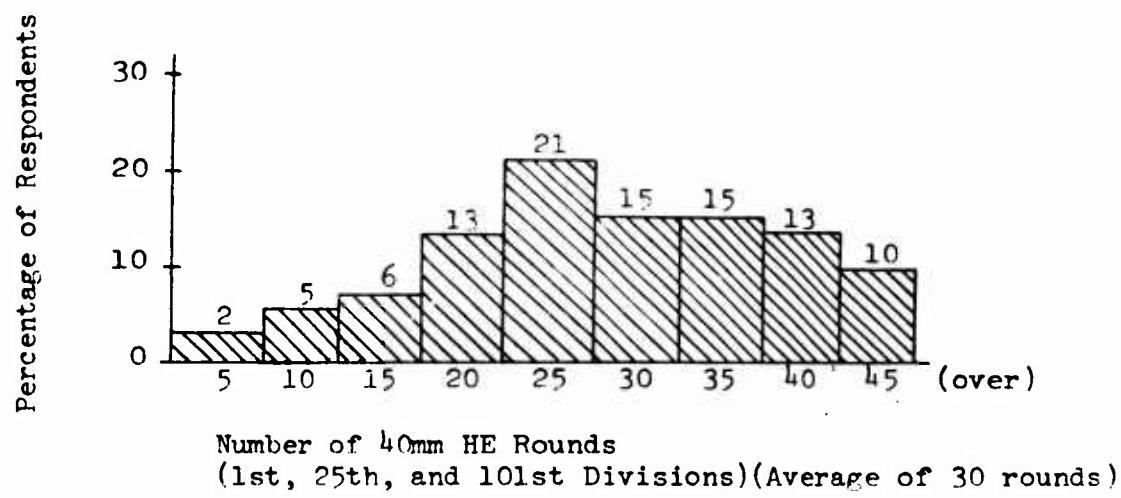


FIGURE II-6. Distribution of the Number of 40mm HE Rounds Carried as Basic Load.

Evaluating Unit	XM203	M79
1st Infantry Division	89	11
4th Infantry Division	80	20
25th Infantry Division	100	0
101st Airborne Division (AM)	84	16
11th Armored Cavalry Regiment	68	32
Combined	83	17

FIGURE II-7. Percentage of Respondents Preferring XM203 and M79.

## 15. FINDINGS

### a. Training Requirements

Since the XM203 was a simple weapon to operate, personnel readily adapted to its use.

### b. Engagements

(1) There were four general classifications of targets engaged by troops armed with the XM203: reconnaissance by fire, personnel, bunkers, and houses. The XM203 was most frequently employed in a reconnaissance by fire role.

(2) Approximately 90 percent of all targets were engaged at ranges less than 200 meters.

(3) The range to targets was influenced by the terrain and mission assigned to the individual armed with the XM203.

### c. Suitability of Battlesight and Quadrant Sight

(1) The battlesight was adequate for training and familiarization firing; however, 73 percent of the respondents did not use it during combat operations.

(2) During training the quadrant sight was found to be extremely accurate, but it was not used on combat operations.

(3) The quadrant sight restricted the movement of personnel armed with the XM203, because vines and limbs frequently caught on the sight.

(4) The battlesight and quadrant sight were used until the firer became proficient in the pointing technique.

d. Portability

(1) The XM203 was awkward to carry using the carrying handle. Most grenadiers improvised a sling that was attached to the front sight post of the M16 and at the small part of the butt stock.

(2) Vines and bushes caught between the M16 rifle barrel and the XM203 barrel.

e. Basic Ammunition Load

(1) A noticeable variation existed between the number of rounds and the type of ammunition carried by individuals armed with the XM203.

(2) The basic ammunition load varied depending on the mission, terrain, unit SOP, and desires of the individual and unit leader.

f. Basis of Issue

Eighty-three percent of the respondents preferred to be armed with the XM203 in lieu of the M79.

### SECTION III

#### OBJECTIVE 2 - TO EVALUATE OPERATIONAL CHARACTERISTICS OF THE XM203

To achieve Objective 2, the following factors were considered: configuration, acceptability, and operational reliability.

##### 16. CONFIGURATION

a. The design of the XM203 and its mounting to the M16 were considered adequate. Each respondent was asked what design changes he would make. The recommended modifications were:

(1) Eliminate the front sling swivel. It hindered movement because it caught on vines and bushes.

(2) Redesign the trigger guard. Many grenadiers pinched their fingers between the trigger guard and the M16 magazine when the XM203 was fired. When the trigger guard was bumped, it sometimes pushed the safety to the SAFE position.

(3) Provide a sling which comes directly over the M16. This change would also eliminate the need for a front sling swivel.

(4) Checker the handgrip on the XM203 barrel to provide better contact when hands are slippery from water, perspiration, etc. These changes were consistent with recommendations made by members of the NETT and five evaluators.

b. Personnel armed with the XM203 consistently placed twice as much grenade fire on a target, when compared with those armed with the M79. This increased rate of fire was attributed to the mechanical extraction and ejection of the expended 40mm cartridge case when the XM203 barrel was moved forward. With the M79, the firer had to manually eject the cartridge. In addition, the firer could move the XM203 barrel forward quicker than "breaking" the barrel of the M79.

##### 17. ACCEPTABILITY

a. Respondents were asked to rate the performance of the XM203. The following results were obtained:

<u>Performance Rating</u>	<u>Percent of Respondents</u>
Outstanding	53
Satisfactory	44
Unsatisfactory	3

In response to another subjective opinion question, 83 percent of the respondents stated that the XM203 was a suitable replacement for the M79.

b. Personnel that rated the weapon as unsatisfactory and not a suitable replacement for the M79 gave the following reasons:

- (1) "Weighs too much and awkward to carry."
- (2) "Two weapons too much. M79 can concentrate on his job and mission."
- (3) "Can't carry enough ammo to be effective."
- (4) "Grenadier is more accurate with the M79; the XM203 would confuse you in contact."

c. The following comments are a sampling of the favorable comments:

- (1) "Good weapon because it gives added protection to the grenadier."
- (2) "The weapon can be used in any situation."
- (3) "It's great for extra firepower. It is designed good, can be loaded and fired especially fast and accurate."
- (4) "I like the weapon for its fire power and simplicity. It also makes the M16 more accurate on automatic fire." (Several respondents said the weight of the XM203 reduced the tendency of the M16 to "climb" off target when the latter was on automatic fire.)

#### 18. RELIABILITY

##### a. Malfunctions

(1) Barrel track separating from the barrel. This occurred on one weapon belonging to the NETT. The barrel was made by Aircraft Arms Inc. during early production and had approximately 1500 rounds fired through it.

(2) Weapon out of battery. This occurred 12 times. The follower failed to travel forward far enough to properly engage the cocking lever. When this happened the barrel did not close and the XM203 could not fire. The probable causes of this were:

(a) Improper assembly and disassembly. If the grenadier accidentally allowed the barrel to slide too far forward when removing the backplate and follower, the weapon could come out of battery. The firer would then have to re-cock the firing pin by inserting an instrument through the breech face firing pin hole and push it back until it engaged the sear.

(b) Excessive dirt. Investigation showed that, when excessive dirt built up on and around the follower assembly, it stopped the follower from moving forward over the cocking lever.

(3) Broken cocking lever. When the XM203 comes out of battery, the cocking lever rides between the face of the follower and the end of the barrel extension. When the firing pin is re-cocked this rotates the cocking lever down and out of the path of the barrel extension. On two occasions the firer attempted to force the barrel closed without re-cocking the firing pin. This resulted in the top of the cocking lever being sheared off.

(4) Broken barrel latch pin. This happened on two occasions to a weapon belonging to the NETT. The barrel latch pin broke into 3 parts after approximately 1500 rounds were fired. The pin was replaced and after 12 rounds were fired it broke again. It was suspected that the pin hole had enlarged allowing pin to float back and forth. A third pin was staked in place which eliminated the problem.

(5) Loose breech plug. Although the breech plugs were supposed to be tightened to 50-inch pounds of torque, some were loose. Once this happened, it eliminated the proper head space and stopped the barrel from being closed when a round was chambered.

b. Shortcomings

(1) Handguard breakage. Handguard inserts broke where they were joined to the handguard by rivets. This was caused by the firer rotating the handguard too far up before disengaging it from the front retainer. When the insert broke, it made the battlesight inaccurate, but the XM203 still functioned.

(2) Safety slippage. Thirty-four percent of the respondents stated the the XM203's safety "jumped" to the SAFE position during firing. When this happened the barrel did not open until the safety was disengaged. This condition did not happen every time the weapon was fired but it occurred enough to be a nuisance. The recoil of the weapon, coupled with the fact that the safety was below its pivot point, seemed to have been the cause of the problem. Four triggers modified by Aircraft Armaments Inc. were evaluated with good results. The new triggers made it impossible for the safety to slip on or be placed on when the weapon was uncocked.

19. FINDINGS

a. Configuration

(1) The design of the XM203 and its mounting to the M16 were adequate.

(2) The front sling swivel hindered movement and was seldom used.

(3) Many grenadiers pinched their fingers between the trigger guard and the M16 magazine when the XM203 was fired.

(4) When the trigger guard was bumped it sometimes pushed the safety to the ON position.

(5) A requirement exists to checker the handgrip of the XM203 to give the firer better contact when his hands become slippery.

(6) A sling which came directly over the M16 was preferred to one that attached to the side of the weapon.

(7) The configuration of the XM203 enabled personnel armed with it to place twice as much fire on a target, when compared to those armed with the M79.

b. Acceptability

(1) Eighty-three percent of the respondents stated that the XM203 was a suitable replacement for the M79.

(2) A total of 97 percent of the respondents rated the performance of the XM203 as outstanding or satisfactory.

c. Malfunctions

(1) After approximately 1500 rounds had been fired through one weapon, the barreltrack separated from the barrel.

(2) There were 12 reported instances in which the barrel failed to close.

(3) On two occasions the XM203's cocking lever broke when the firer attempted to force the barrel closed without re-cocking the firing pin.

(4) Some weapons had loose breech plugs, which prevented the barrel from closing properly. This undesirable situation was corrected by tightening the breech plug.

d. Shortcomings

(1) Handguard inserts broke where they were joined to the handguard by rivets, when the firer rotated the handguard too far up before disengaging it from the front retainer.

(2) Thirty-four percent of the respondents stated that the XM203's safety "jumped" to the SAFE position during firing.

## SECTION IV

### OBJECTIVE 3 - TO DETERMINE MAINTENANCE REQUIREMENTS FOR THE XM203

To achieve Objective 3, the following factors were taken into consideration: identification of parts prone to rust and wear, prescribed maintenance, and tools required for cleaning and maintenance.

#### 20. IDENTIFICATION OF PARTS PRONE TO RUST AND WEAR

a. After approximately 30 days use in RVN, rust appeared on the following parts:

- (1) Trigger
- (2) Safety and safety plunger
- (3) Trigger guard
- (4) Extractor
- (5) Ejector
- (6) Battlesight
- (7) Front sight post well of the quadrant sight
- (8) Quadrant mounting Allen-head screws

b. There was no indication of any parts wearing during the evaluation period.

#### 21. PRESCRIBED MAINTENANCE

a. Excessive dirt on the barrel and receiver track caused sluggish and difficult movement of the XM203 barrel. Without daily maintenance to the interior of the barrel, failure to extract occurred. Daily maintenance should have consisted of:

- (1) Cleaning and light lubrication of the interior of the barrel.
- (2) Cleaning and light lubrication of the barrel and receiver track.
- (3) Cleaning the breech face.

b. Malfunctions occurred as a result of excessive dirt in the receiver assembly. Periodic cleaning would have prevented most malfunctions. An effort was made to determine a specific time schedule for cleaning the interior of the receiver, but this was not possible because of the variance in climatic conditions, terrain, and tactical situations. Periodic maintenance should have consisted of:

- (1) Removing the handguard and cleaning the M16 barrel, slip ring, and upper part of the XM203 receiver.
- (2) Removing the receiver backplate and follower assembly for cleaning and lubrication.
- (3) Cleaning and light lubrication of the battlesight and quadrant sight.
- (4) Lubrication of all springs.
- (5) Cleaning of all springs (armorer only).

## 22. NECESSARY TOOLS

a. The standard M79 bore brush was the only tool needed to clean the bore. The M16 chamber and bore brushes were adequate for cleaning the receiver assembly of the XM203.

b. A simple tool was required to re-cock the XM203 when it got out of battery. Grenadiers often used the large safety pin that came with the bandolier of 5.56mm ammunition.

## 23. FINDINGS

### a. Identification of Parts Prone to Rust and Wear

- (1) Parts listed in paragraph 20a were prone to rust.
- (2) Rust did not affect the operation of the XM203 during the evaluation period.
- (3) There was no replacement of parts due to wear.

### b. Prescribed Maintenance

The performance of prescribed maintenance was inadequate.

### c. Necessary Tools

- (1) The M79 bore brush and the M16 rifle bore and chamber brushes were adequate for cleaning the XM203.

(2) A tool was needed to re-cock the firing pin when the weapon got out of battery.

## SECTION V

### CONCLUSIONS AND RECOMMENDATIONS

#### 24. CONCLUSIONS

- a. The XM203 is suitable for use by US Army units in RVN.
- b. The XM203 is simple to operate and personnel can readily adapt to its use.
- c. The battlesight and quadrant sight are useful during training and familiarization firing, but they are not needed once the firer becomes proficient in the pointing technique.
- d. The XM203 is well suited for employment in a reconnaissance by fire role.
- e. The most comfortable way for a grenadier to carry the XM203 is by a sling that attaches to the front sight post and the small part of the butt stock.
- f. A prescribed basic load for the XM203 cannot be determined because of variables such as mission, terrain, and individual preference.
- g. During combat in RVN personnel prefer to be armed with the XM203, rather than the M79, because the XM203 provides greater firepower and versatility.
- h. The basic design of the XM203 is satisfactory, but the following modifications need to be made:
  - (1) Remove the front sling swivel.
  - (2) Modify the trigger so the safety does not inadvertently slip to the SAFE position.
  - (3) Modify the trigger guard so the firer's finger will not be pinched between the trigger guard and M16 magazine.
  - (4) Check the handgrip of the XM203 to give the firer better contact when his hands become slippery.
  - (5) Modify the sling for attachment to the front sight and butt plate.
  - (6) Modify the handguard insert so it does not break when the firer tries to disengage it from the front retainer.

- i. A simple tool is needed to re-cock the firing pin when the weapon gets out of battery.
- j. Some process needs to be developed to treat the XM203's metal parts so they will not rust.
- k. No new tools need be developed to clean the XM203.

25. RECOMMENDATIONS

It is recommended that:

- a. The XM203 replace the M79.
- b. The modifications indicated in paragraph 24h, i, and j be provided the XM203.
- c. The quadrant sight be eliminated from the XM203.

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED
Army Concept Team in Vietnam APO San Francisco 96384		2b. GROUP
3. REPORT TITLE  XM203 40mm Grenade Launcher Attachment Development		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Final Report		
5. AUTHOR(S) (First name, middle initial, last name)  LTC David H. Weddington		
6. REPORT DATE August 1969	7a. TOTAL NO. OF PAGES 35	7b. NO. OF REFS 4
8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER(S) ACG-14/69I	
b. PROJECT NO.	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) None	
c. None	d. None	
10. DISTRIBUTION STATEMENT  [Redacted]		
11. SUPPLEMENTARY NOTES None	12. SPONSORING MILITARY ACTIVITY US Army, Vietnam APO San Francisco 96375	
13. ABSTRACT The Army Concept Team in Vietnam evaluated the XM203 40mm Grenade Launcher Attachment Development to determine its suitability for tactical use by US Army units in RVN. The XM203 was designed to provide the rifle squad's grenadier with a weapon incorporating an M16 rifle and a grenade launcher. In April 1969, 500 XM203s were sent to RVN and distributed to the 1st, 4th, and 25th Infantry Divisions, the 101st Airborne Division (Airmobile), and the 11th Armored Cavalry Regiment for a three-month evaluation. The salient conclusions of the evaluation are:  1. The XM203 is suitable for use by US Army units in RVN. 2. The battlesight and quadrant sight are useful during training; however, they are not used once the firer becomes proficient in the pointing technique. 3. The basic design of the XM203 is satisfactory; however, the following changes need to be made: a. Remove the front sling swivel. b. Modify the trigger so the safety does not inadvertently slip to the safe position. c. Modify the trigger guard so the firer can be assured his finger will not be pinched between the trigger guard and M16 magazine. d. Check the handgrip of the XM203 to give the firer better contact when his hands become slippery. e. Modify the sling for attachment to the front sight and butt plate. f. Modify the handguard insert so it does not break when the firer tries to disengage it from the front retainer. 4. During combat in RVN personnel prefer to use the XM203, rather than the M79 40mm Grenade Launcher, because the XM203 provides greater fire power and versatility. It is recommended that: 1. The XM203 replace the M79. 2. The modifications indicated in paragraph 3 be provided the XM203, and that the quadrant sight be eliminated.		

DD FORM 1473 1 NOV 68  
REPLACES DD FORM 1473, 1 JAN 64, WHICH IS  
OBSOLETE FOR ARMY USE.

UNCLASSIFIED  
Security Classification

**UNCLASSIFIED**

Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
GRENADE LAUNCHER ATTACHMENT DEVELOPMENT						
XM203 GRENADE LAUNCHER						
40MM GRENADE LAUNCHER						
GLAD						

**UNCLASSIFIED**

Security Classification